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REPLY DECLARATION OF WILLIAM HOGG

I, William Hogg, hereby declare the following:

1. I am the Senior Vice President of Network Planning and Engineering, AT&T Services, Inc. My background and qualifications are described in my initial Declaration, filed on April 20, 2011 (the "Declaration").

I. INTRODUCTION

2. In my Declaration, I demonstrated the spectrum and capacity constraints that AT&T's network is facing as a result of the company's leading position in the mobile broadband revolution and the ever-increasing demand for our mobile broadband services;[1] how the transaction will result in unique, capacity-expanding network efficiencies, which will directly benefit both companies' customers;[2] and why alternative network strategies, which AT&T pursues aggressively, can provide only limited, localized relief and cannot replicate – in the timeframe needed to avoid capacity constraints – the significant network efficiencies and much-needed capacity expansion that will only result by integrating the AT&T and T-Mobile USA networks and spectrum.[3]

3. The White Paper of Professor Jeffrey H. Reed and Dr. Nishith D. Tripathi discusses the fundamental engineering principles that underpin the network efficiencies I

[1] Declaration of William Hogg, Senior Vice President of Network Planning and Engineering, AT&T Services, Inc., ¶¶ 3-7, 36-41 (Apr. 20, 2011) ("Hogg Decl.").

[2] *Id.* ¶¶ 10-13, 42-64.

[3] *Id.* ¶¶ 65-74.

described in my Declaration. I have reviewed this White Paper and concur with the technical findings concerning the capacity and network efficiencies presented by the combination of AT&T and T-Mobile USA.[4]

4. Some commenters, including Sprint's technical consultant, Steven Stravitz, have questioned whether AT&T needs the transaction with T-Mobile USA to address AT&T's capacity constraints. In addition, they argue that AT&T could achieve the same capacity gains by pursuing alternative strategies. In this Reply Declaration, I respond to these and related claims.

II. AT&T FACES GROWING SPECTRUM AND CAPACITY CONSTRAINTS

A. AT&T Faces Real and Significant Spectrum and Capacity Constraints

5. Mr. Stravitz and other opponents question AT&T's spectrum and capacity constraints. However, Stravitz also points to the reason why these arguments are wrong: mobile networks must be "designed to handle traffic during the busiest hour of the day" and are "based on probabilistic models that predict a network's ability to handle a particular level of peak traffic with a level of certainty."[5] This is precisely what I and my team of expert engineers do, drawing on years of *actual* experience in running AT&T's wireless network. As set forth in the Reed/Tripathi White Paper, engineering a network to meet current and projected future demand requires taking into account, among other things, available spectrum, cell density, how much bandwidth subscribers use, precisely where and when they use it, and the myriad of ways in

[4] *See* Prof. Jeffrey H. Reed and Dr. Nishith D. Tripathi, *Analysis of Network Efficiencies Associated With The Proposed Acquisition By AT&T, Inc. of T-Mobile USA, Inc.* (June 6, 2011) ("Reed/Tripathi White Paper").

[5] Declaration of Steven Stravitz, Chief Executive Officer and Managing Director, Spectrum Management Consulting, ¶ 13 (May 29, 2011) ("Stravitz Decl.").

which these factors may vary on a local basis and may change quickly in response to changes in subscriber usage patterns, such as those caused by innovative (and bandwidth-intensive) new mobile applications.[6]

6. AT&T uses cellular and PCS spectrum to support its GSM and UMTS networks. Because the amount of traffic on a wireless network is not homogeneous across time or geography,[7] AT&T's RAN Network Planning group uses complex methods to measure and predict peak loads. And, when those peak loads are projected to reach a level that threatens network performance in a market where no spectrum and corresponding radio capacity can be added to provide capacity to meet demand at an acceptable quality level, AT&T identifies those markets as facing spectrum exhaust. These spectrum exhaust forecasts are used for capital budgeting and network planning purposes and are formulated in the following manner.

7. **[Begin Confidential Information]**

[8] [9]

[6] Reed/Tripathi White Paper at 6-8.

[7] *Id.* at 7.

[8] A sector is a geographic region covered by a base station using a directional antenna. Typically, cell sites have three sectors per cell site, however, as discussed below in paragraph 52, AT&T increases the number of sectors where it can improve network performance and capacity.

[9] Reed/Tripathi White Paper at 7.

8.

[10]

[End Confidential Information].

9. Given the dynamic and complex variables taken into account in projecting demand, AT&T's RAN Network Planning group refines its spectrum exhaust analysis with each iteration based on previous studies, changes in actual and anticipated demand, subscriber profiles, technological advancements, network changes, spectrum acquisitions, and operational experience, among other factors. While these projections attempt to reflect operational realities, our experience has been that these forecasts often understate the real-world spectrum and capacity constraints in certain markets. In other words, individual markets often experience spectrum and capacity exhaust as indicated by operational key performance measures even earlier than the projections set forth in the latest version of the spectrum exhaust analysis. And,

[10] **[Begin Confidential Information]**

[End Confidential Information].

the constant introduction of new devices and services that consume large amounts of bandwidth continues to upend our projections of exhaust.

10. Based on the process described above, as of April 2011, AT&T's RAN Network Planning group projected that, through 2013, AT&T will require, but lack, the cellular and PCS spectrum to deploy additional UMTS carriers in **[Begin Confidential Information] [End Confidential Information]** Cellular Market Areas ("CMAs"), covering nearly **[Begin Confidential Information] [End Confidential Information]** people.[11] AT&T's RAN Network Planning group further projected that AT&T lacks the cellular and PCS spectrum to launch and support UMTS service in one or more counties in another **[Begin Confidential Information] [End Confidential Information]** CMAs, covering more than **[Begin Confidential Information] [End Confidential Information]** people.[12] A list of those CMAs is attached as Exhibit A.[13]

11. Some opponents dispute that any carrier could have capacity constraints outside of densely populated urban areas. In fact, as Exhibit A demonstrates, AT&T's Ran Network Planning group projects spectrum and capacity constraints that are affecting, and will affect,

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[11] Hogg Decl. ¶ 37.

[12] *Id.* ¶ 39. In my Declaration, one CMA, **[Begin Confidential Information] [End Confidential Information]**, was counted as both a market where AT&T lacks the spectrum to deploy an additional UMTS carrier as well as a market where AT&T lacks the spectrum to launch and support UMTS service. Thus, as of April 2011, AT&T projected that it lacks the spectrum to launch and support UMTS service in one or more counties in **[Begin Confidential Information] [End Confidential Information]** CMAs, rather than **[Begin Confidential Information] [End Confidential Information]** CMAs. *See Id.*

[13] **[Begin Confidential Information**

[End Confidential Information]

AT&T in urban, suburban, *and* rural areas throughout the country. As of April 2011, AT&T projects that, between now and 2013, it does not have the cellular and PCS spectrum to deploy the additional carriers that will be needed to meet UMTS demand in **[Begin Confidential Information] [End Confidential Information]** Rural Service Areas ("RSAs") where AT&T has already launched UMTS service,[14] and it lacks the necessary cellular and PCS spectrum in one or more counties to launch and support UMTS in **[Begin Confidential Information] [End Confidential Information]** RSAs.[15]

B. AT&T Faces Spectrum and Capacity Constraints Despite Its Efficient Use of Its Spectrum Holdings

12. Opponents contend that AT&T's 700 MHz, AWS, and WCS spectrum holdings could immediately be used to address its GSM and UMTS capacity constraints. To the contrary, AT&T lacks the infrastructure to immediately provide UMTS and GSM services over 700 MHz and AWS spectrum, and its over 97 million GSM and UMTS customers do not have handsets and other devices that are compatible with those technologies on 700 MHz or AWS spectrum. AT&T would have to install the necessary equipment, change antennas throughout its footprint to support the 700 MHz and AWS spectrum, and replace the handsets of AT&T's customer base – a process that would be costly and time-consuming and could not be accomplished in time to address AT&T's spectrum and capacity constraints.

[14] These **[Begin Confidential Information] [End Confidential Information]** CMAs are a subset of the **[Begin Confidential Information] [End Confidential Information]** exhaust CMAs described above.

[15] These **[Begin Confidential Information] [End Confidential Information]** CMAs are a subset of the **[Begin Confidential Information] [End Confidential Information]** CMAs described above.

13. Moreover, AT&T is already using 700 MHz and AWS spectrum to deploy its LTE network, and the same spectrum assignment cannot be used simultaneously for LTE and UMTS service in a geography. AT&T has recently announced that it will begin offering commercial services in five markets – Dallas, Houston, Chicago, Atlanta and San Antonio – in the summer of 2011, and plans to cover 70 million Americans with LTE service by year-end 2011. By 2013, its deployment is planned to reach 80 percent of all Americans. Because of the spectrum, scale, and other resources resulting from the merger, AT&T will be able to expand its LTE deployment to more than 97 percent of the population.

14. Further, as I described in my Declaration, LTE offers many benefits to consumers over earlier technologies: it is 30-40 percent more spectrally efficient than HSPA+ and 860 percent more spectrally efficient than GSM; offers peak data speeds up to four times faster than HSPA+ and two times faster than HSPA+ with dual carriers; and provides up to an approximately 60 percent increase over HSPA+ in uplink speeds.[16] LTE also offers dramatically reduced latency and an all Internet-Protocol based architecture, both of which are important for video conferencing, interactive gaming, and many new and innovative applications.[17] Thus, it would be inefficient, and would stifle innovation, for AT&T to use its 700 MHz and AWS spectrum holdings for UMTS or GSM service rather than to implement its LTE deployment, which is already underway.

[16] Hogg Decl. ¶¶ 25-26.

[17] Global developments will cement this superiority of LTE over HSPA+. As providers across the world adopt LTE, research and development efforts will focus on LTE network equipment and end-user devices. Eventually, the ecosystem for HSPA+ will lack the scale, growth, and innovation needed to keep pace with LTE.

15. Some opponents contend that simply using its 700 MHz and AWS spectrum to deploy LTE will ensure that AT&T's capacity constraints are short-term, because the introduction of and migration to LTE service will fully address any capacity constraints AT&T might be experiencing. This is not true. Given the amount of AWS and 700 MHz spectrum that AT&T will have available to devote to LTE, AT&T projects that the demand for LTE service also will grow more quickly than our capacity. Past experience has shown that when AT&T provides a faster mobile broadband network, subscriber usage grows quickly after deployment. For example, when AT&T rolled out HSPA+ with Ethernet, it experienced average data traffic increases of **[Begin Confidential Information] [End Confidential Information]** in areas that received that upgrade. Consistent with this experience, AT&T expects a significant increase in traffic when it deploys its LTE network. This transaction will provide AWS spectrum holdings that can be used to deliver a more robust LTE deployment and address the LTE capacity challenges AT&T projects it is likely to face in a number of areas as early as **[Begin Confidential Information] [End Confidential Information]** without additional spectrum.

16. Further, AT&T cannot use its WCS spectrum to address its GSM/UMTS spectrum and capacity constraints (or for LTE deployment) because the technical limitations and rules designed to protect Satellite Digital Audio Radio Service ("SDARS") in adjacent spectrum make WCS spectrum unsuitable for mobile broadband services at this time. Moreover, regulatory uncertainty regarding the technical and service rules, which remain contested by all sides, has meant that licensees and equipment vendors have yet to make decisions about

equipment design, manufacturing, and acquisition. As a consequence, the devices and infrastructure to use WCS for mobile broadband services do not exist.

C. Accelerated Migration of GSM and/or UMTS Customers Is Not a Viable Means to Resolve AT&T's Capacity Constraints

17. Some opponents claim that AT&T could solve its capacity issues without the transaction by quickly phasing out its GSM network altogether and transitioning customers and spectrum to more efficient technologies. Others claim that AT&T could accelerate its LTE deployment and reduce congestion on its other spectrum as GSM and UMTS customers migrate to LTE. AT&T's goal is, in fact, to migrate its customers and spectrum to more efficient technologies, but it is *this transaction* that will provide the additional capacity to allow that migration to take place without degrading service for GSM and UMTS subscribers.

18. AT&T's experience is that it takes significant time to transition customers from one technology to the next. One of the biggest obstacles is that customers must replace their handsets to transition to a new technology, and many customers simply do not wish to do so. Even when offered economic incentives to replace their handsets with newer devices and technologies, many customers choose to retain their current device and their current service.

19. Indeed, the migration of customers from AT&T's GSM network to its UMTS network is taking considerable time despite aggressive action by AT&T. In recent years, as exploding usage rates have put increasing strain on AT&T's network, we have actively targeted GSM customers with heavy usage patterns in capacity constrained areas for migration to a UMTS service plan. **[Begin Confidential Information]**

[End Confidential Information]. Transitioning these customers is necessary to allow AT&T to free up spectrum currently devoted to GSM for re-purposing to more efficient UMTS service (while maintaining service quality for remaining GSM subscribers).

20. Despite these efforts, many customers remain on GSM service today. In fact, after five years of offering and heavily marketing UMTS service, only about **[Begin Confidential Information] [End Confidential Information]** of AT&T's total customers subscribed to UMTS service as of the end of 2010.[18] To put the magnitude of the migration from GSM to UMTS into perspective, AT&T still has **[Begin Confidential Information] [End Confidential Information]** GSM customers. With this many subscribers to transition, it simply will take a significant number of years to transition the customers to UMTS or LTE, regardless of how aggressive AT&T is in promoting that migration.

21. AT&T's experience with sunsetting TDMA service is also telling. After nearly **[Begin Confidential Information] [End Confidential Information]** of intense efforts to transition approximately **[Begin Confidential Information] [End Confidential Information]** customers to digital service, about **[Begin Confidential Information] [End Confidential Information]** subscribers remained to migrate despite the prospect of complete service shutdown and **[Begin Confidential Information]**

[End Confidential Information].

[18] Hogg Decl. ¶ 40.

22. Given the time involved in transitioning customers, as well as AT&T's spectrum holdings and subscriber and network profiles, the migration of customers from GSM to UMTS simply cannot be done quickly enough to address AT&T's existing and impending GSM and UMTS spectrum and capacity constraints.

23. Nonetheless, AT&T redeploys spectrum from GSM to UMTS to relieve capacity constraints where possible. For example, in **[Begin Confidential Information]**

[End Confidential Information]. And, even if AT&T could completely transition all of its customers in a particular market from GSM to UMTS in an extremely accelerated manner in a market facing exhaust, AT&T could not turn down its GSM network in that market because the rest of AT&T's GSM customer base will need to use that network when they travel to the "turned-down" area.

24. While transitioning subscribers to LTE is also not a solution to AT&T's capacity challenges, AT&T is quickly ramping up that network. In January 2011, AT&T made the decision to accelerate its LTE deployment schedule by one year and now plans to cover 80 percent of the U.S. population by the end of 2013. AT&T also has been selling an LTE-compatible device, the USBConnect Adrenaline, to enable customers to take advantage of the LTE network once it is launched, effectively pre-seeding the market with an available device.[19] However, given the explosive rate of growth in mobile broadband services that is projected over

[19] LTE-capable smartphones have only recently become commercially available, and there are no such devices currently available that will work on AT&T's LTE network.

the next several years and the time it will take to transition over 97 million GSM and UMTS customers, the LTE migration will not address the near- and mid-term capacity constraints AT&T projects on its GSM and UMTS networks without this transaction.

25. Simply put, among other significant and unique network benefits, the transaction provides AT&T with the time needed to migrate both customers and spectrum to more efficient technologies. That is to say, by significantly expanding capacity and pushing back the dates of expected exhaust in many markets, the merger will allow AT&T sufficient time to complete the transition of customers to LTE without degrading service for those customers remaining on those earlier technologies.[20]

III. THE TRANSACTION ADDRESSES SPECTRUM AND CAPACITY CONSTRAINTS AND CREATES SIGNIFICANT NETWORK EFFICIENCIES

A. The Combined Company Will Achieve Efficiencies and Capacity Gains Throughout Its Network

26. In my Declaration, I explained how the combined company would achieve capacity-creating synergies through: (a) increasing cell density by integrating more than **[Begin Confidential Information] [End Confidential Information]** T-Mobile USA sites; (b) freeing up spectrum by eliminating redundant GSM control channels that use 4.8 to 10 MHz of spectrum; (c) realizing efficiencies from combining the two companies' channel pools; and (d) optimizing spectrum allocation in areas where one company's network and spectrum are underutilized relative to the other's.[21]

[20] *See* Reed/Tripathi White Paper at 29.

[21] Hogg Decl. ¶¶ 43-56.

27. The combined company's network efficiency gains will depend on several key factors that will vary market-by-market. These include the number of T-Mobile USA sites that the combined company will integrate into the combined network, the size of each company's channel pools in a given market, the amount of spectrum currently devoted to GSM control channels based on each company's frequency re-use plan for that area, the spectrum holdings, and current and future network traffic in each area. Further quantification of these network efficiencies must await detailed engineering information for each company and full integration planning. Even if they cannot be fully quantified with precision, however, for the reasons explained in the White Paper of Professor Reed and Dr. Tripathi, the efficiencies I discussed in my Declaration resulting from this transaction are well-understood and accepted throughout the wireless industry.[22] It is clear, even at this stage, that the significant network efficiencies that will result from the transaction will give the combined company considerably more capacity than the total amount of capacity the two companies possess or could generate standing alone. These capacity gains will address AT&T's spectrum and capacity constraints in CMAs throughout the country where we are experiencing or will experience spectrum and capacity exhaust. And these efficiencies should not be discounted because some are generated initially on the GSM network. Anything that relieves spectrum constraints on the GSM network furthers the goal of re-purposing that spectrum more quickly for more spectrally efficient technologies.[23]

[22] Reed/Tripathi White Paper at 3; Reply Declaration of Dr. Kim Kyllesbech Larsen, Senior Vice President, Technology Service and International Network Economics, Deutsche Telekom AG, ¶ 3 (June 9, 2011) ("Larsen Reply Decl.").

[23] Larsen Reply Decl. ¶ 15.

28. In an effort to estimate potential capacity gains as a result of the transaction, Professor Carlton, Dr. Shampine, and Dr. Sider (collectively "Professor Carlton") implemented a simplified framework intended to allow a comparison of the capacity of the AT&T and T-Mobile USA networks on a standalone basis with the combined capacity available as a result of the transaction. The model cannot capture, and thus does not take into account, all of the capacity gains made possible by this transaction – in particular, channel pooling and utilization efficiencies – and any cascading effect those efficiencies have on the ability of the combined company to re-purpose spectrum to more efficient use. But the model does address other efficiencies, and to that end, I provided the following data for the specific areas for which the calculations were done: (i) the number of sectors in the network; (ii) the amount of spectrum that is equipped in a sector with a given technology (GSM, UMTS, or LTE);[24] and (iii) the number of bits/second that can be carried on a given hertz of spectrum (bits/second/hertz) for each technology.

29. Professor Carlton calculated the capacity gains for two scenarios. The "base" case reflects near-term projections of spectrum allocation across different technologies and with and without the proposed merger. It assumes a post-merger scenario with limited LTE deployment and that AT&T has successfully increased network density based on current cell site integration projections and realized efficiencies from the elimination of GSM control channels, enabling some GSM spectrum to be shifted to more efficient technologies. The "final" scenario

[24] I based these metrics on the number of sectors in the AT&T and T-Mobile USA standalone networks in a given geographic area and estimates of sectors currently in use. Additionally, I provided to Professor Carlton estimates of the number of sectors that will be used in the combined network post-merger, which were based on engineering assumptions regarding cell site spacing for the combined network.

reflects a longer-term view that is roughly consistent with AT&T's view of likely LTE deployment and its assumptions about levels of LTE deployment that might be achieved with and without the merger. These projected use cases assume GSM spectrum is shifted to more efficient UMTS and LTE technologies in approximately equal proportions and the same amount of spectrum holdings with and without the proposed merger.

30. These parameters do not reflect the full range of real world considerations involved in running a wireless network, and Professor Carlton's simplified peak capacity calculations could not reasonably be used to estimate in absolute terms how much traffic a real world network could handle (because of temporal, geographic, and uplink/downlink load variations and other abstractions from the real world RF environment). However, they are a reasonable way to calculate the *relative* potential ranges of capacity gains from integrating the networks in a given geography and network configuration.

B. Cell Site Density from Integration of T-Mobile USA Sites

31. As explained in my Declaration, by integrating complementary T-Mobile USA cell sites, the transaction will create a significantly denser cell grid than either company could achieve on its own in the time that it will take AT&T to complete the network integration process, or for several years thereafter.[25] Based upon my extensive experience with network integration, the cell site retention criteria I have employed are reasonable, and the cell density benefits I have documented will be realized.[26]

[25] Hogg Decl. ¶¶ 43-47; s*ee also* Reed/Tripathi White Paper at 8-12.

[26] Larsen Reply Declaration ¶ 11; Reed/Tripathi White Paper at 10-12.

32. Post-closing, the combined company will undertake a detailed engineering analysis on a site-by-site basis to determine which T-Mobile USA sites should be kept. The more than **[Begin Confidential Information] [End Confidential Information]** T-Mobile USA cell sites that AT&T currently estimates it will integrate post-transaction are generally those sites AT&T believes will increase the capacity of the combined company's network because of the complementary location of these sites as compared to AT&T's site locations.[27] This initial proximity analysis makes clear that a large portion of T-Mobile USA sites are in locations that not only complement AT&T's grid, but that also address AT&T's capacity concerns.[28]

33. AT&T has conducted a preliminary market analysis of downtown San Francisco and Washington, D.C. that maps the location of existing AT&T and T-Mobile USA cell sites. This analysis, which includes areas where AT&T is experiencing, or will be experiencing, peak load congestion issues, confirms that the T-Mobile USA sites are well-positioned to address AT&T's current and future spectrum and capacity constraints in these markets. In Exhibit B, blue circles indicate cell sites where AT&T is located today. The pink squares outlined in black identify T-Mobile USA cell sites in the area. As indicated on the maps, T-Mobile USA has

[27] **[Begin Confidential Information]**

[End Confidential Information] AT&T will determine which T-Mobile USA sites to integrate and which to decommission based on a careful engineering analysis.

[28] *See id.* ¶ 11.

many cell sites that AT&T could choose to address current and future areas of congestion.[29] Professor Reed and Dr. Tripathi performed a similar analysis, which "strongly confirm[s] AT&T's distance-based metric for synergistic gains."[30]

34. Opponents argue that AT&T's cell site integration plan would result in customers being served by fewer cell sites. To the contrary, and as stated by Dr. Larsen, the combined company will have substantially more cell sites than either presently has on a standalone basis.[31] As of the end of 2010, T-Mobile USA had nearly **[Begin Confidential Information] [End Confidential Information]** cell sites and AT&T had nearly **[Begin Confidential Information] [End Confidential Information]** cell sites. By overlaying more than **[Begin Confidential Information] [End Confidential Information]** T-Mobile USA cell sites on top of AT&T's, the combined company will have roughly **[Begin Confidential Information] [End Confidential Information]** cell sites throughout the country. This equates to approximately **[Begin Confidential Information] [End Confidential Information]** more cell sites than T-Mobile USA's standalone network and **[Begin Confidential Information] [End Confidential Information]** more cell sites than AT&T's. And, this denser cell grid will expand capacity beyond the sum of the capacity of the two companies standing alone.

[29] In selecting T-Mobile USA sites for integration into the AT&T network, we are not limited to only those sites that would address current constrained areas. Instead, we would evaluate all available options, including those T-Mobile sites that are complementary to AT&T cell sites that are currently not experiencing exhaust but will in the future.

[30] Reed/Tripathi White Paper at 11.

[31] Larsen Reply Decl. ¶ 14.

35. As I explained in my Declaration, the network integration process will occur on a rolling basis.[32] The combined company will quickly achieve efficiencies and capacity gains in areas where they are needed most. For example, AT&T expects to integrate T-Mobile USA sites in areas of some markets within approximately nine months. AT&T will target those areas facing the most urgent capacity constraints for this initial work, such as **[Begin Confidential Information] [End Confidential Information]**.

C. **Network Efficiencies Will Improve Consumer Experience**

36. Opponents argue that the merger of two companies, each facing capacity challenges, will degrade the service provided to customers. To the contrary, the network efficiencies discussed above, along with the spectrum and other resources gained from the transaction, will provide the combined company with the additional capacity needed to preserve and improve network performance and service quality for customers of both AT&T and T-Mobile USA, including improved service quality for current T-Mobile USA customers in markets where T-Mobile USA is capacity constrained.[33]

37. AT&T has a proven track record of achieving such service improvements. For example, following the Cingular/AT&T Wireless transaction, after the combined company integrated its network, nationwide dropped call rates for Cingular Wireless customers improved by an average of **[Begin Confidential Information] [End Confidential Information]** and for AT&T Wireless customers by an average of **[Begin Confidential**

[32] Hogg Decl. ¶ 67.

[33] *See* Larsen Reply Decl. ¶ 13.

Information] **[End Confidential Information]**. In certain areas, the improvements in dropped call rates were well above the combined company's national average. For example, in New England, Cingular Wireless customers saw a **[Begin Confidential Information]** **[End Confidential Information]** improvement, and AT&T Wireless customers saw a **[Begin Confidential Information]** **[End Confidential Information]** improvement. The capacity gains made possible by this transaction will likewise improve the customer experience by relieving network congestion that would otherwise result in more dropped and failed calls and slower data speeds.

38. Moreover, beyond those capacity gains, T-Mobile USA's GSM customers also will gain significant coverage improvements, such as post-closing access to AT&T's GSM network, including its low band cellular spectrum.[34] As T-Mobile USA's UMTS subscribers transition to compatible handsets and migrate to the AT&T network, they also will gain broader on-net UMTS coverage, including more than double the geographic UMTS coverage they have today, as well as better in-building coverage as a result of access to low band 850 MHz cellular spectrum and a higher density cell grid post-integration.[35] And, as discussed below, the transaction will deliver the benefits of LTE to T-Mobile USA customers.

D. **The Transaction Will Provide LTE Service to More Consumers Sooner**

39. Prior to the merger, AT&T's plan was to deploy LTE to 80 percent of the U.S. population by the end of 2013. However, because of the scale, spectrum, and other resources

[34] Hogg Decl. ¶ 57.

[35] *Id.* ¶ 58.

resulting from the transaction, AT&T is now able to commit to expand LTE to over 97 percent of the U.S. population.

40. Opponents assert that AT&T would deploy LTE to more than 97 percent of the U.S. population even in the absence of the transaction, but such speculation ignores the economic reality facing AT&T. Expanding coverage from 80 to over 97 percent of the population will require AT&T to almost triple the land mass covered by its LTE network, from below 20 percent of the United States to approximately 55 percent. And, it costs nearly twice as much per covered person in capital expenditures to provide mobile wireless services to sparsely populated areas than to densely populated areas. AT&T estimates that this expansion would cost approximately **[Begin Confidential Information] [End Confidential Information]** in additional capital expenditures. After considering the marketing benefits of expanded LTE deployment, including competitive considerations and the fact that AT&T will deploy HSPA+ 4G service to 97 percent of the population by the end of 2012, AT&T's senior management concluded that an 80 percent deployment was as much as could be justified on a standalone basis.

41. The transaction changes the calculus for LTE deployment in important respects. It gives AT&T the scale, scope, and resources that collectively enable it to increase its LTE deployment from 80 to 97 percent coverage of the U.S. population. First, the merger will provide AT&T with additional AWS spectrum that can be used for LTE. That additional spectrum will enable AT&T to fill in holes where AT&T either has thin 700 MHz and AWS spectrum holdings or lacks such spectrum at all.

42. AT&T currently does not have 700 MHz or AWS spectrum but will obtain AWS spectrum from T-Mobile USA in approximately **[Begin Confidential Information] [End Confidential Information]** CMAs (with about **[Begin Confidential Information] [End Confidential Information]** people).

43. The merger will also supplement AT&T's thin 700 MHz and AWS spectrum holdings in another approximately **[Begin Confidential Information] [End Confidential Information]** CMAs covering nearly **[Begin Confidential Information] [End Confidential Information]** people. As a result of the transaction, AT&T will hold an average of 20 MHz of AWS spectrum (10 MHz of downlink and 10 MHz of uplink) for LTE in those markets.

44. The additional AWS spectrum from T-Mobile USA will also directly benefit several major markets, including **[Begin Confidential Information] [End Confidential Information]** by giving AT&T 20 MHz of contiguous spectrum to deploy a 2X10 MHz LTE product that it could not before.

45. Because of the spectrum gains and the overall economic benefits resulting from the transaction, senior management made a business judgment that the merger with T-Mobile USA allowed AT&T to expand its LTE build-out to 97 percent of the population. These economic benefits include incremental reductions in cost due to the addition of T-Mobile USA resources, greater scale economies, such as higher volume discounts on handsets and equipment, a larger customer base, and the expectation of a higher take-rate for its LTE service. In addition, the transaction will enable AT&T to re-purpose its existing capital budget allocated to spectrum acquisitions to be allocated for other uses. Overall, the scale and scope of the larger combined

wireless business will permit the additional capital investment to be spread over a larger revenue base than would be the case absent the merger.

46. For all of these reasons, AT&T's management concluded that, because the merger with T-Mobile USA results in greater revenues, customers, and overall scale, AT&T could better absorb the capital investment and lower returns associated with building out to over 97 percent of the population of the United States.

47. Contrary to some opponents' arguments, AT&T's judgment not to deploy LTE to 97 percent of the population on a standalone basis already took account of competitive considerations, including Verizon's announced plans to deploy LTE across its current 3G footprint. Verizon's plans neither decrease AT&T's costs of such deployment nor increase its expected revenues. Moreover, Verizon's existing 3G EVDO service is significantly slower than 4G HSPA+, and thus Verizon has a much stronger imperative to upgrade to LTE throughout its footprint to remain competitive.

IV. ALTERNATIVES TO THE TRANSACTION ARE INADEQUATE

48. In today's competitive environment, my principal charge from AT&T is to find as many ways as possible to improve network performance. As my colleague David A. Christopher, AT&T's Chief Marketing Officer, explains in his Reply Declaration, AT&T competes in each local market based on network performance, among other factors.[36] Our research indicates **[Begin Confidential Information]**

[End Confidential Information] and further studies

[36] Reply Declaration of David A. Christopher, Chief Marketing Officer, Mobility and Consumer Markets, AT&T Mobility Services, LLC, ¶ 28 (June 10, 2011).

[Begin Confidential Information]

[End Confidential Information].[37] Customers are exposed to extensive local competitive network messaging touting new technology build-outs and localized network speed and reliability claims. **[Begin Confidential Information]**

[End Confidential Information].

49. Accordingly, we have made it a top company priority to expand capacity in areas where it is needed and to implement state-of-the-art methods for network optimization. This means that my group and I are, and have been, aggressively pursuing all reasonable strategies to address capacity and spectrum challenges, including adding cell sites, deploying additional UMTS carriers to the extent possible, overlaying GSM sites with UMTS equipment, and deploying LTE technology. AT&T also has, and will continue to, avail itself of other measures to optimize network performance, such as sector reorientation, antenna tilt adjustments, and increasing backhaul capacity.

50. Mr. Stravitz and other opponents, however, claim that AT&T could achieve the same or even better capacity gains on its own, without this transaction. They claim that AT&T could relieve its constraints by building a more "heterogeneous" network using technology like Wi-Fi and femtocells to offload traffic from the macro cell network. They also claim that AT&T could achieve the cell density benefits of the transaction by adding cell sites on its own, including by collocating on structures where T-Mobile USA has cell sites.

[37] *Id.*

51. These arguments grossly underestimate the cost, time, and difficulties in pursuing these strategies, and grossly overestimate in most cases the capacity gains (if any) that could be achieved. AT&T has vigorously pursued network improvements and, despite all of these efforts to date, AT&T continues to project severe spectrum and capacity constraints over the next three years. The simple fact of the matter is that these measures would not come close to producing the capacity gains and efficiencies made possible by this transaction in anything close to the same time frame.[38]

A. Wi-Fi, DAS, and Other Offloading Methods Do Not Significantly Address AT&T's Capacity Challenges

52. Opponents inaccurately contend that AT&T's capacity constraints can be resolved by deploying a variety of offloading methods. However, as described in my Declaration, AT&T is already aggressively engaged in building such a cohesive network.[39] As an industry leader in alternative solutions, AT&T has deployed more than 24,000 Wi-Fi hotspots; 15 permanent hotzones[40] (with approximately **[Begin Confidential Information] [End Confidential Information]**; over **[Begin Confidential Information] [End Confidential Information]** public Distributed Antenna Systems ("DAS"), and more than **[Begin Confidential Information] [End Confidential Information]** femtocells (also called microcells) throughout the country. AT&T already employs sector-splitting throughout its network where appropriate, with over **[Begin Confidential Information] [End Confidential Information]** six-sector splits in progress for 2011, and approximately **[Begin**

[38] As discussed in my Declaration, AT&T also has implemented tiered pricing structures. These have not curtailed customer demand to an extent that would resolve capacity constraints.

[39] Hogg Decl. ¶¶ 31-34.

[40] *See id.* ¶ 34 n.14.

Confidential Information] **[End Confidential Information]** planned for 2012.[41] All of these methods, however, are localized solutions that are simply not designed – and are in no way sufficient – to address AT&T's widespread spectrum and capacity constraints.

53. Wi-Fi and DAS solutions are intended to offload traffic in small, individual areas, not provide coverage and capacity similar to a cell site.[42] DAS are very expensive, relative to cell splits, and provide meaningful offload only in localized areas that are much smaller than those served by a macro cell site, such as a sports arena, airport, hospital, or college campus.[43] AT&T has deployed Wi-Fi and DAS in areas with high user densities and will continue to do so in locations where those methods are effective.

54. Unlike Wi-Fi and DAS, femtocells are designed to address coverage – not capacity – issues in extremely localized areas, like a home or office building that are on the fringe of the network coverage area, rather than to expand capacity or offload traffic from the macro network.[44] Thus, a femtocell does not provide any capacity benefits for those users, because they generally do not access the macro network in areas served by the femtocell. Moreover, if a femtocell user is in an area that is not on the fringe of the macro network, there could be difficulties in handing-off between the femtocell and the macro network that reduce the femtocell's effectiveness.

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[41] While sector splits can be effective for improving capacity in localized areas, they are not suitable for all locations due to interference, performance, and tower loading concerns.

[42] Hogg Decl. ¶ 73.

[43] *Id.*

[44] *Id.*; Reed/Tripathi White Paper at 31.

B. **Adding New Sites Is Not a Sufficient Alternative to the Transaction**

55. Opponents contend that, as an alternative to the transaction, AT&T could simply add **[Begin Confidential Information] [End Confidential Information]** new cell sites on its own by building them, leasing space on towers owned by third parties, and/or collocating on T-Mobile USA structures. These arguments significantly understate the difficulties and time involved in adding new cell sites into a network and ignore the accelerated timeframe and streamlined process with which AT&T could integrate T-Mobile USA cell sites into the combined network.[45] Significantly, they also ignore all of the other important capacity-enhancing, unique benefits of this transaction, including additional spectrum, channel pooling, elimination of redundant control channels, and utilization efficiencies.

56. As I explained in my Declaration, AT&T is already aggressively building new cell sites, adding approximately **[Begin Confidential Information] [End Confidential Information]** sites per year in recent years. As a result of these aggressive building plans, AT&T had over **[Begin Confidential Information] [End Confidential Information]** more cell sites than Verizon Wireless, as of the end of 2010.

[45] The process of integrating an existing T-Mobile USA site into the combined company's network will generally require only identifying the site, obtaining minimal zoning and building permits, replacing the existing antenna with a multi-band antenna, and installing electronics equipment at the base of the structure. Because AT&T generally will replace T-Mobile USA's existing antennas and equipment with comparable equipment, in many instances zoning and regulatory approvals may not be needed or can be significantly expedited. In his Declaration, Mr. Stravitz speculates that AT&T's multiband antennas may be heavier than T-Mobile USA's antennas and that, as a result, some complementary sites would not be able to support these new antennas. Stravitz Decl. ¶ 28. In fact, many of AT&T's multiband antennas are similar in size to T-Mobile USA antennas and replacing one for the other generally should not present any obstacle in terms of load on the structure. Moreover, in most cases, the antenna profile and wind load are the primary considerations, not weight. *See also* Larsen Reply Decl. ¶ 12.

57. Professor Reed and Dr. Tripathi make clear that the notion that AT&T could build **[Begin Confidential Information] [End Confidential Information]** new cell sites within 24 months is completely unrealistic.[46] And, as I explained previously and confirmed by Professor Reed and Dr. Tripathi as well as Dr. Larsen, once a network has a dense grid in high traffic areas, it becomes exponentially more difficult to find locations in the *real world* that meet all of the necessary requirements – *i.e.*, that maintain the appropriate distance from existing cell sites, that have the right height, orientation, and lack of obstructions, *and* that have space available.[47]

58. In looking for new site locations, AT&T explores all available options. For instance, AT&T has close working relationships with tower companies and other wireless carriers that own towers, and we have entire teams devoted to identifying good new build and collocation fits for our network. Indeed, of the new sites added to AT&T's network in 2010, **[Begin Confidential Information] [End Confidential Information]** were on existing facilities owned or built by third parties. In particular, about **[Begin Confidential Information] [End Confidential Information]** of AT&T's 2010 new sites were on existing or new structures owned by American Tower, and American Tower alone owns approximately **[Begin Confidential Information] [End Confidential Information]** of all structures on which AT&T cell sites are located. Thus, opponents' claims that AT&T could accelerate the process by leasing space on existing towers or other structures instead of building its own cell sites is misplaced. AT&T actively pursues every opportunity to add sites

[46] Reed/Tripathi White Paper at 12.

[47] Hogg Decl. ¶ 43; Reed/Tripathi White Paper at 9; Larsen Reply Decl. ¶ 10.

using third-party tower companies but acceptable and available site locations are few and far between.[48]

59. Moreover, as I demonstrated in my Declaration, the process to add new cell sites, either by constructing a new tower or leasing space on an existing tower or other facility owned by a third party, is inherently complex and lengthy.[49] To add a new cell site, AT&T must, among other things, conduct a search of the targeted area to find a suitable and available location; negotiate to acquire the site through purchase or lease; comply with any applicable environmental, historic preservation, and other regulatory requirements that can necessitate extensive studies and consultation; apply for and obtain building permits and zoning approvals; contract with third-party vendors to purchase the needed equipment; undertake necessary buildout of the site; install the new antenna and equipment; deploy backhaul transport to the site; and integrate the site into the existing network. Each of these steps is subject to delays beyond AT&T's control.

60. Plus, adding cell sites to AT&T's network on a structure owned by a third party is essentially the same process – it entails each of the steps previously described, including the negotiation of a lease and obtaining zoning approvals and permits. Consequently, even when leasing space on existing towers, the addition of these sites can be fraught with delay.

61. Nor would leasing space on T-Mobile USA towers be a solution. The vast majority of T-Mobile USA's cell sites are collocated on equipment structures owned by third

[48] Many existing sites are located on such structures as flagpoles, church steeples, power transmission lines, rooftops, and other places that cannot accommodate another carrier's separate equipment due to space, weight, and other limitations. Thus, as a practical matter, those structures would not be available for AT&T to lease space.

[49] Hogg Decl. ¶¶ 67-71.

parties and thus leasing space on such towers would present all of the same difficulties discussed above. T-Mobile USA itself only owns about **[Begin Confidential Information] [End Confidential Information]** towers and other structures, and AT&T generally looks to collocate on those towers where space is available and they improve AT&T's network design. But AT&T's ability to collocate on many of these T-Mobile USA-owned structures is limited because some structures would not be able to accommodate the required equipment of another carrier. Thus, simply collocating on structures owned by T-Mobile USA would not provide an adequate alternative to the cell density that the transaction is expected to achieve. If, on the other hand, the T-Mobile USA-owned structures are incorporated into the combined network, we could replace the existing antenna and therefore not be limited by the space and load restrictions that might prevent installation of another antenna.

C. Spectrum From the Qualcomm Transaction Will Not Resolve AT&T's Capacity Constraints

62. Some opponents contend that the 700 MHz spectrum AT&T proposes to acquire from Qualcomm will resolve AT&T's capacity constraints. They claim that AT&T can use this spectrum through spectrum or channel bonding to relieve UMTS and GSM capacity constraints. That is not accurate, and no benefit will be derived from that spectrum until late 2014 at the earliest.

63. The Qualcomm 700 MHz spectrum is unpaired (one-way) and, even once the technology, standards, and equipment are available to integrate it with two-way services (which AT&T expects will take until at least late 2014 at the earliest), the spectrum will provide only a supplement to downlink capacity. In contrast, T-Mobile USA's PCS and AWS spectrum can be put to immediate use to relieve capacity constraints, as the equipment and handsets for UMTS on

PCS spectrum are currently available, and the equipment and handsets for LTE on AWS spectrum will be available later this year. In addition, while the Qualcomm spectrum will be valuable to help bridge the gap until the FCC makes additional spectrum available for auction, the unpaired spectrum that AT&T will obtain is simply not comparable to, or a substitute for, the spectrum the T-Mobile USA transaction would bring and offers none of the other efficiencies that would result from the network integration.[50]

D. A Network-Sharing or Spectrum-Sharing Agreement Between AT&T and T-Mobile USA Is Not an Alternative to the Transaction

64. Opponents claim that AT&T and T-Mobile USA could enter a network sharing relationship, but these types of arrangements cannot achieve the capacity-enhancing benefits of the transaction.

65. A network sharing arrangement that is short of a complete integration, such as one where the carriers share common equipment, would not achieve many of the specific network efficiencies discussed above (e.g., channel pooling efficiencies and the elimination of redundant control channels) and is typically only relevant for coverage situations. Moreover, because T-Mobile USA utilizes its AWS spectrum for UMTS service, which AT&T is dedicating to LTE, a network-sharing arrangement could not provide AT&T with sufficient UMTS offload or sufficient AWS spectrum to expand its LTE network. Absent a complete integration, a network

[50] Channel bonding, which allows noncontiguous spectrum to be "bonded" together into a single channel, is also not a solution for AT&T's spectrum and capacity constraints, as some opponents assert. To begin with, technology allowing channel bonding with non-contiguous spectrum or asymmetrical spectrum blocks is not available at this time. Moreover, as discussed above, AT&T is utilizing all of its available spectrum suitable for mobile wireless services either for current GSM and UMTS use or for its rollout of more efficient LTE service.

sharing arrangement between AT&T and T-Mobile USA would not produce nearly the same extent of capacity-expanding efficiencies as this transaction.

66. Network-sharing also involves many governance and network-planning issues – important practical concerns that can significantly affect the efficacy of any joint venture. For example, it would be unclear how critical decisions about future network expansion and changes (*e.g.*, LTE deployment decisions) would be made. Inevitably, those decisions could not fully reflect the interests and needs of both providers and their customers, and such issues would only be amplified in a complete integration of both networks. Moreover, a complete network integration would be extremely complicated to unwind.

V. CONCLUSION

67. Despite efficient use of spectrum resources, AT&T's spectrum and capacity constraints are real and significant. The combination of AT&T's and T-Mobile USA's networks will result in numerous, significant, and unique efficiencies that provide the most effective, efficient, and immediate solution to these spectrum and capacity challenges. The additional capacity achieved through the integration of the two networks will push back spectrum exhaust dates in markets throughout the country and give AT&T the turnaround time necessary to transition customers to more efficient technologies – without degrading service for subscribers of earlier technologies.

I declare under penalty of perjury that the foregoing is true and correct. Executed on June 9, 2011.

Signed: 

William Hogg
Senior Vice President of Network
Planning and Engineering
AT&T Services, Inc.

REDACTED – FOR PUBLIC INSPECTION

Exhibit A

**CMAs Where AT&T Projected as of April 2011
It Will Require, But Lack, the Cellular and PCS Spectrum
to Deploy Additional UMTS Carriers:**

[Begin Highly Confidential Information]

[End Highly Confidential Information]

REDACTED – FOR PUBLIC INSPECTION

CMAs Where AT&T Projected as of April 2011
It Lacks the Cellular and PCS Spectrum to Launch and Support UMTS Service:

[Begin Highly Confidential Information]

[End Highly Confidential Information]

Exhibit B

[REDACTED]

[REDACTED]